

• General Description

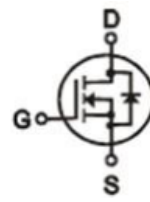
The ZM140N10HD combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

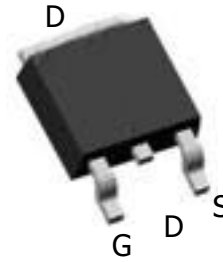
- SMPS 2nd Synchronous Rectifier
- BLDC Motor driver

• Product Summary


$V_{DS} = 100V$

$R_{DS(ON)} = 14m\Omega$

$I_D = 35A$


TO-252
• Ordering Information:

| | |
|---------------------------|------------|
| Part NO. | ZM140N10HD |
| Marking | ZM140N10H |
| Packing Information | REEL TAPE |
| Basic ordering unit (pcs) | 2500 |

• Absolute Maximum Ratings (T_C = 25°C)

| Parameter | Symbol | Rating | Unit |
|---------------------------------------|----------------------|------------|------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | $I_D@TC=25^\circ C$ | 35 | A |
| | $I_D@TC=75^\circ C$ | 26.6 | A |
| | $I_D@TC=100^\circ C$ | 22.1 | A |
| Pulsed Drain Current ① | I_{DM} | 80 | A |
| Total Power Dissipation(TC=25°C) | $P_D@TC=25^\circ C$ | 70 | W |
| Total Power Dissipation(TA=25°C) | $P_D@TA=25^\circ C$ | 2.8 | W |
| Operating Junction Temperature | T_J | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Single Pulse Avalanche Energy@L=0.1mH | E_{AS} | 80 | mJ |
| Avalanche Current@L=0.1mH | I_{AS} | 40 | A |

•Thermal resistance

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--|------------|------|------|------|---------------|
| Thermal resistance, junction - case | R_{thJC} | - | - | 1.8 | $^{\circ}C/W$ |
| Thermal resistance, junction - ambient | R_{thJA} | - | - | 45 | $^{\circ}C/W$ |
| Soldering temperature, wavesoldering for 10s | T_{sold} | - | - | 265 | $^{\circ}C$ |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|-----------------------------------|--------------|-------------------------------|------|-----|-----------|------------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 100 | | | V |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$ | 2 | | 4 | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=100V, V_{GS}=0V$ | | | 1.0 | μA |
| Gate- Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| Static Drain-source On Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=24A$ | | 14 | 17 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=25V, I_D=10A$ | | 20 | | s |
| Source-drain voltage | V_{SD} | $I_S=24A$ | | | 1.28 | V |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|------------------------------|-----------|---------------------------------------|------|------|------|------|
| Input capacitance | C_{iss} | $V_{GS}=0V, V_{DS}=30V$ $f = 1MHz$ | - | 4200 | - | pF |
| Output capacitance | C_{oss} | | - | 184 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 150 | - | |

•Gate Charge characteristics($T_a=25^{\circ}C$)

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|----------------------|----------|---|------|-----|------|------|
| Total gate charge | Q_g | $V_{DD} = 30V$ $I_D = 20A$ $V_{GS} = 10V$ | - | 74 | - | nC |
| Gate - Source charge | Q_{gs} | | - | 20 | - | |
| Gate - Drain charge | Q_{gd} | | - | 10 | - | |

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

Fig.1 Gate-Charge Characteristics

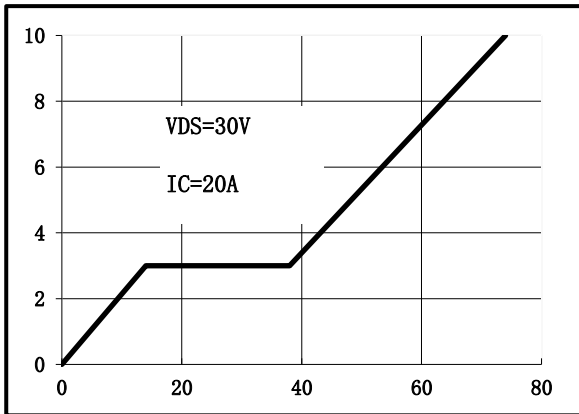


Fig.2 Capacitance Characteristics

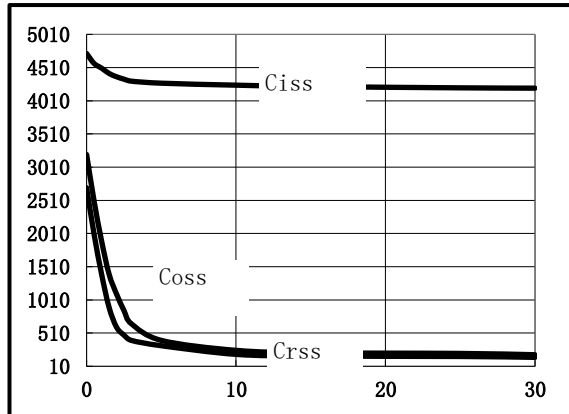


Fig.3 Power Dissipation

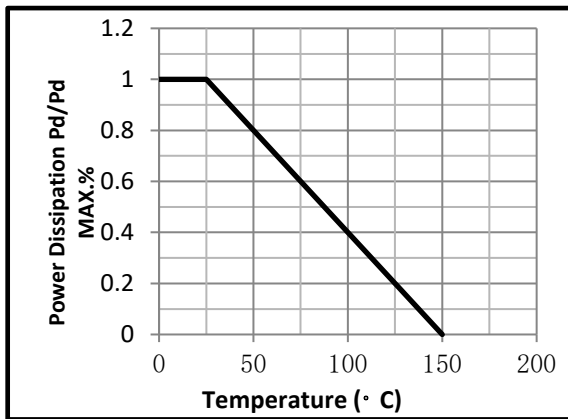


Fig.4 Typical output Characteristics

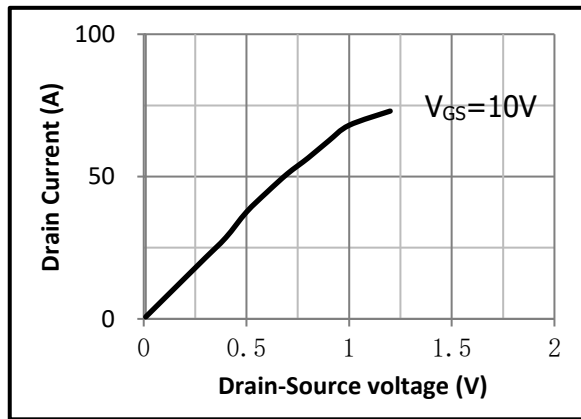


Fig.5 Threshold Voltage V.S Junction Temperature

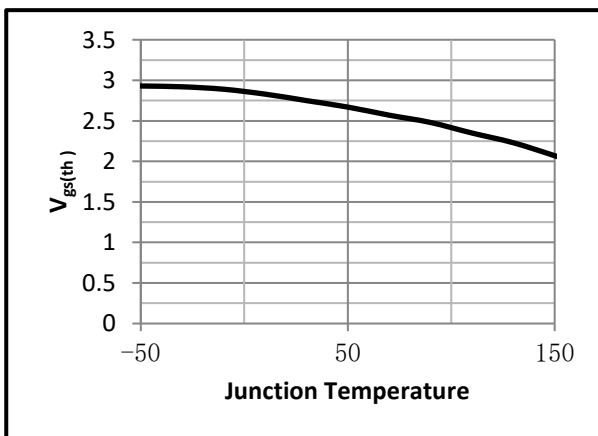


Fig.6 Resistance V.S Drain Current

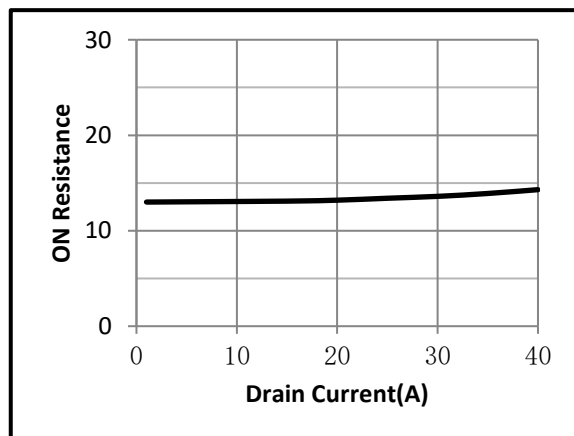


Fig.7 On-Resistance VS Gate Source Voltage

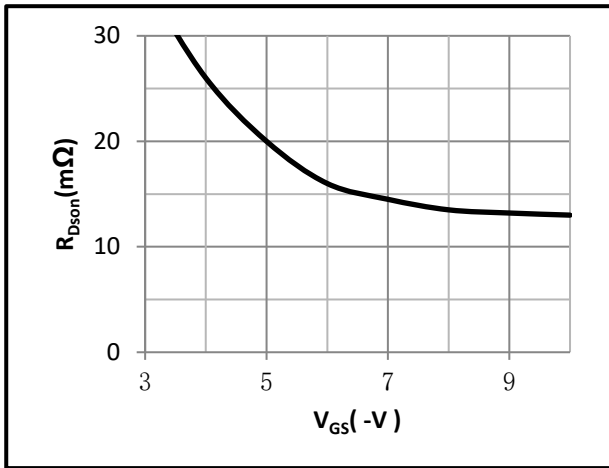


Fig.8 On-Resistance V.S Junction Temperature

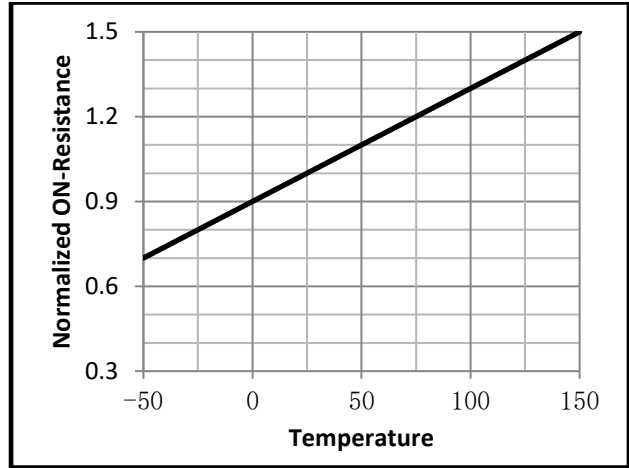


Fig.9 Switching Time Measurement Circuit

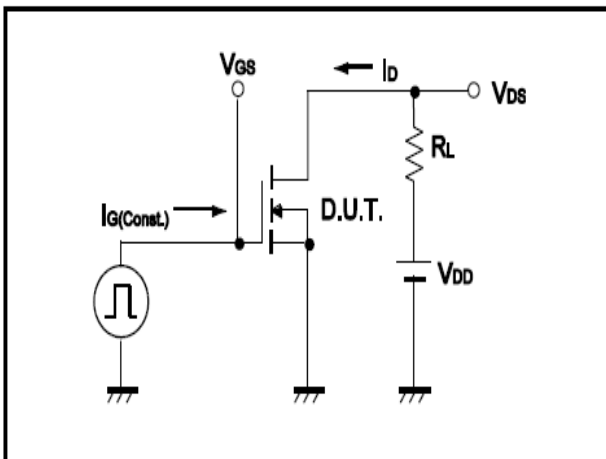


Fig.10 Gate Charge Waveform

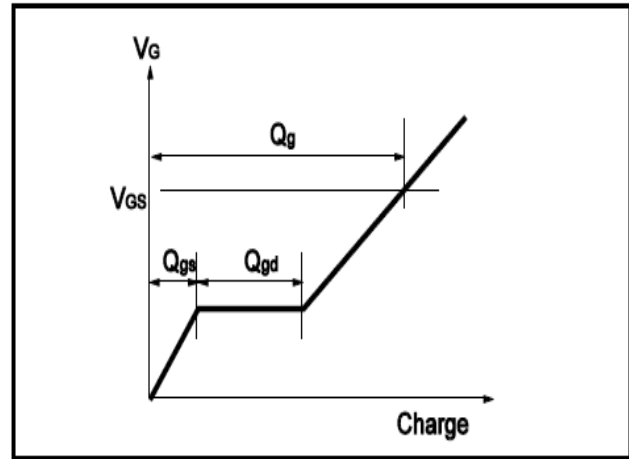


Fig.11 Switching Time Measurement Circuit

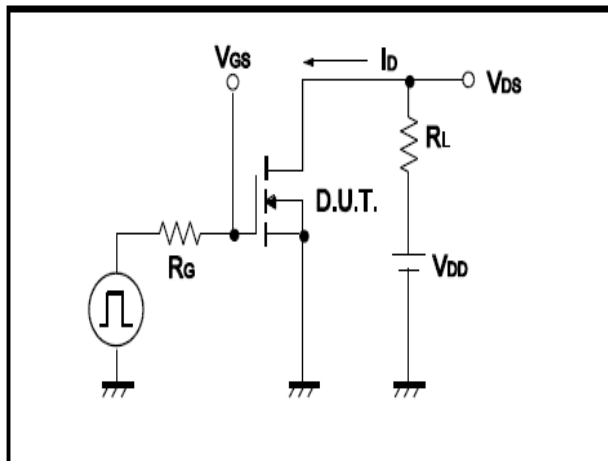
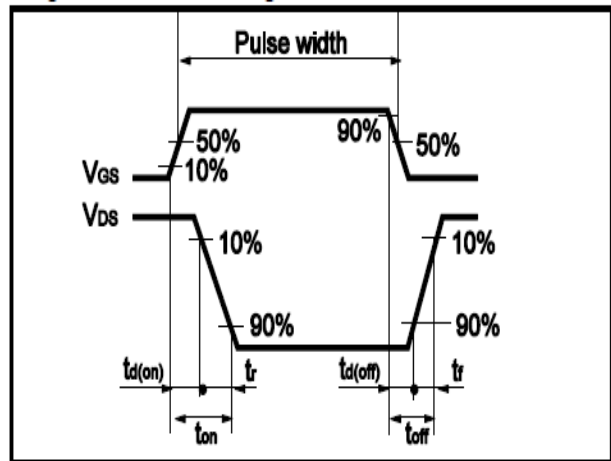


Fig.12 Gate Charge Waveform



•Dimensions(TO-252)

Unit: mm

| SYMBOL | min | max | SYMBOL | min | max |
|--------|------|-------|--------|------|------|
| A | 2.10 | 2.50 | B | 0.85 | 1.25 |
| b | 0.50 | 0.80 | b1 | 0.50 | 0.90 |
| b2 | 0.45 | 0.70 | C | 0.45 | 0.70 |
| D | 6.30 | 6.75 | D1 | 5.10 | 5.50 |
| E | 5.30 | 6.30 | e1 | 2.25 | 2.35 |
| L1 | 9.20 | 10.60 | e2 | 4.45 | 4.75 |
| L2 | 0.90 | 1.75 | L3 | 0.60 | 1.10 |
| K | 0.00 | 0.23 | | | |

